1.1 INTRODUCTION

This is an era of advanced educational technology and its applications. Computer assisted instructions is one of the advanced programmed devices in the present scenario. Programmed learning is a method of individualized instructions in which the student receives information related to his own needs in progressive sequences but in small units. Learner remains active and proceeds at his own rate. Learner knows immediately whether he is right or wrong. Programmed learning represents a highly individualized and systematic instructional strategy for classroom instructions as well as self learning.

Computer assisted instructions provide direct learning experience to the user. It is a learning device which is interactive. The learner can choose his own pace and pause for testing in computer assisted instructions. Depending on individual’s grasp and progress, the computer guides him through different paths of learning—a shorter path for an advanced learner and a longer for others.

Computer assisted instructions facilitates learning by interaction with the content in a flexible manner. It can be used anytime, at any place and under any situation with basic requirements. It caters to specific learning needs of individual learners.

The Association For Education Communications And Technology (1977) has defined Computer assisted instructions (CAI) as a method of instruction in which computer is used to instruct the students and where the computer contains the instruction which is designed to teach, guide and test the students until the desired level of proficiency is attained.

Since the advent of microcomputers in 1970s, computer use in schools has become widespread, from primary schools through the university level and in some preschool
programs. Computer assisted instructions either present information or fill a tutorial role, testing role for the students. By providing one on one interaction and producing immediate responses to input answers, computer assisted instructions allow students to demonstrate mastery step and learn new material at their own pace. A disadvantage is that computerized instruction cannot extend the lesson beyond the limits of the programming.  

(c.f. Gupta, A.2008)

The rapid co-evolution of technology and learning is offering new ways to represent knowledge, new educational practices and new global communities of learners. Yet the contribution of these changes to formal education is largely unexplored, along with possibilities for deepening our understanding of what and how to learn. The convergence of personal technologies offers new opportunities for informal, conversational and situated learning.  

(c.f. Bawa, S.K.2014)

The day may not be very far off when most Indian classrooms have a computer. Everyday teaching through computers can then become possible. However, educators, administrators, researchers and parents all have doubts about its real learning value. While no one denies the need for making every student computer literate, there are misgivings about the effectiveness of computers for teaching. It becomes essential to see some evidence that computers in classrooms are more than expensive time wasting toys, that use of computers for teaching enhances learning in demonstrable ways.

Computer assisted instruction (CAI) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. It uses a combination of text, graphics, sound and video in learning process. The computer has many purposes in the classroom and it can be utilized to help a student in
all areas of the curriculum. CAI programs use tutorials, drill and practice, simulation and problem solving approaches to present topics and to test the student’s understanding. These programs let students progress at their own pace, assisting them in learning the material. The subject matter taught through CAI can range from basic concepts and facts to more complex concepts in maths, history, science, social studies, arts and language.

B.F. Skinner (1950), a behaviorist perhaps best known for his work with operant conditioning with pigeons, began working with programmed instruction in late 1950s. He believed that it was necessary to develop teaching machines capable of teaching student skills such as arithmetic and spelling, using his operant conditioning theories as a basis for his efforts. Though Skinner’s true message was of the need to develop programs of instruction, the initial attention was monopolized by the machines themselves, leading to the teaching machine revolution. Skinner’s idea of teaching machines had pushed the idea of instruction based on behaviorist theories and laid the groundwork for computer assisted instructions in the decades to come. Other approaches to instruction during this period focused on an individualized course of study for each student.

The Program for Learning in Accordance with Needs, (1970) approach asked schools to select from a bank of behavioral objectives that would be pieced together to form lessons. Despite PLAN’s success and expanding participant pool, the cost of updating the bank of items proved to be prohibitive, resulting in the program’s early termination. By the late 1970s, these individualized instruction programs would fall out of favour for a variety of reasons, including problems resulting from poor implementation in the schools and inconclusive results regarding their efficacy relative to traditional approaches.
Early Computer assisted instruction efforts carried on the tradition of using behaviorist models to shape the learner’s responses through a series of trials. These programs became known as “drill and practice” and “tutorial” applications and gained in popularity during the rapid decline of programmed instruction. This led to rapid funding of major CAI initiatives using resources originally designated for now failed approaches, allowing CAI to quickly establish itself on the academic scene. Support for CAI dissipated rapidly in the late 1970s for several reasons like computers at that time were extremely expensive, often making their rapid adoption in schools prohibitively expensive despite significant interest and excitement from academicians and government leaders. Also the prosperous market envisioned by computer makers and software companies never materialized, forcing several companies to close funds to reinvest elsewhere. In the late 1970s and early 1980s, the appearance of the microcomputer revitalized the CAI movement. Because computers were now smaller and cheaper and because they were beginning to find their way into the everyday lives of average individuals, they became more palatable to schools and districts. The National Educational Technology Plan of 2004 points to near ubiquitous presence of computers and internet access in schools today, yet acknowledges a significant lack of planning and preparation for teachers and schools to make full use of these advantages.

Computer assisted instruction is a self learning technique involving interaction of the student with programmed instructional materials. Computer assisted instruction is an interactive instructional strategy whereby a computer is used to present the instructional material and monitor the learning that takes place.
Computer assisted instructions uses a combination of text, graphics, sound and video in enhancing the learning process. The computer has many purposes in the classroom and it can be utilized to help a student in all areas of the curriculum.

Computer assisted instructions refer to the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation and problem solving approaches to present topics and they test the student’s understanding. Typical CAI provides text or multimedia content, questions, problems, immediate feedback, notes on student’s performance, exercises, worksheets, tests for practice.

Types of Computer Assisted Instructions

1. Drill and practice: Drill and practice provide opportunities for students to repeatedly practice the skills that have previously been presented and that further practice is necessary for mastery.

2. Tutorial: Tutorial activity includes both the presentation of information and its extension into different forms of work, including drill and practice, games and simulation.

3. Games: Games software often creates a contest to achieve the highest score and either beat others or beat the computer.

4. Simulation: Simulation software can provide an approximation of reality that does not require the expense of real life or its risks.

5. Discovery: Discovery approach provides a large database of information specific to a course or content area and challenges the learner to analyze, compare, infer and evaluate based on their explorations of the data.
6. Problem Solving: This approach helps children develop specific problem solving skills and strategies.

Advantages of CAI:
1. It provides one to one interaction.
2. It is a great motivator for the learner.
3. It provides freedom to experiment with different options.
4. It provides instantaneous response and immediate feedback to the answers elicited.
5. It allows self pacing and permits the student to proceed at his own pace.
6. It helps the teacher to devote more time to individual students.
7. It helps the shy and slow learners to learn in privacy.
8. It helps the creative and exceptionally highly intelligent learners to learn the concepts rapidly.
9. Multimedia helps to understand difficult concepts through multisensory approach.
10. It provides self directed learning-students can decide when, where and what to learn.

Limitations of CAI

1. Lack of supportive infrastructure in the schools.
2. Learning becomes too mechanical.
3. Non availability of good CAI packages.
4. Over use of multimedia may divert the attention from the content.
5. The learner may become overconfident by quick availability of information and resources. *(c.f. Nehru, R. S. S. 2014)*

No doubt CAI has a few limitations yet computer assisted instructions have the potential to bring about increased achievement in Indian classroom teaching in
various subjects. Science is an important subject in the school curriculum that has an important effect on the life of an individual. So effective teaching in all the subjects including science and environmental education is essential for the development of the country. Limitations of teaching various subjects can be overcome by CAI. Sometimes teachers have in depth knowledge of the subject but they cannot draw good sketches and diagrams, this can be overcome by use of CAI. Some teachers do not possess a big enough knowledge base to link scientific content with day to day examples this can be overcome by CAI. For effective teaching, teachers need to collect ample background information, for which they may not have the resources, time or inclination this can be overcome by CAI. Computer assisted instructions can also provide for the topics which lack audio visual aids. Teachers often need to carry several charts, equipment, specimens etc. even for teaching a single topic effectively. However, often these materials are either unavailable or inaccessible, moreover, teachers donot have enough time between classes to procure and test it for its usability, this can be overcome by use of CAI. It is believed that computers can not only help overcome these problems, but vastly greater potential of this technology as an effective teaching aid will cause a quantum leap in the quality of teaching and learning. Most teaching materials available for use by teachers may not be able to accommodate the individual needs of the teacher. For example, educational films produced abroad do not match the local curriculum and are hard to understand due to different accents. Today, general purpose, easy to use software such as Microsoft Power Point has become available. Now, teachers can easily modify and even construct their own CAI material based on the needs of their own classes.
We therefore need to study afresh the utility of the current generation of hardware and software in teaching learning and conduct research on what techniques are effective. Environment is an important area related to biological sciences which needs to be worked on to spread awareness regarding pollution and create healthy surroundings to live in.

The magnificent mountains, the lushy green forests, the great rivers, the deep oceans and seas, the blue lagoons and lakes, marvelous reservoir of underground wealth -water and minerals, the bewildering species of animals, the beautiful birds with all their musical tones, several insects, pests, tiny and invisible micro organisms - all these constitute our planet - Earth, our global environment. Our immediate surroundings form the environment.

Environment plays a vital role in human life. A human is a by product of heredity and environment. These two variables are integrated in such a way that we cannot isolate them from each other.

A living being = Heredity x Environment

Heredity is the transmission of characters from parents to offspring. The word heredity is derived from the Latin word "hereditas" which means heir ship or inheritance. Heredity is genetic factor that determines the individual's characteristics responsible for the resemblance between parents and offspring. The sum total of inherited characteristics in the organism may be stated as heredity. The environment is the external condition or the surrounding especially in which people live and work. Heredity is predetermined and cannot be modified but environment can be modified.

The word "Environment" is derived from the French word environner which means to encircle or surround. Environment can be defined as the circumstances or conditions that surround an organism or group of organisms, or the complex of social or cultural conditions that affect an individual or community. (c.f. Kumar, T.P. 2009)

Eduard Sues (1875) an Australian geologist has defined environment as any region, surrounding or circumstances in which anything exists or everything external to the organism. The environment of an organism includes the organic or abiotic milieu (geographical location) including non-living organic matter and all other organisms, plants and animals in the region. The Environment of human beings includes the abiotic factors of land, water, atmosphere, climate, sound, odours and tastes, the biotic factors of animals, plants, bacteria, virus and social factors of aesthetics.

Rowntree (1981) has defined Environment as "A term much used in educational discussion (e.g. in talk of a child's intellectual growth through interaction with his environment.) It refers to things, events and people in the real world around the child that he might perceive or that might have some effect on him".

In Environmental Conversation Act 1989, Environment has been defined as the aggregate of surrounding objects, conditions and influences that affect the life and habits of man or any other organism or collection of organisms.

According to, The National Environment Management Act of 1998, Environment means the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth, micro-organisms, plant and animal life, any part or combination of one and two and the relationship among and between them, and
the physical, chemical, aesthetical and cultural properties and conditions of the foregoing that influences human health and well being.

The Environmental Management Policy for South Africa 1998 defines the Environment as the biosphere in which people and the other organisms live. It consists of the Renewable and Non-Renewable natural resources such as water (fresh and marine), land and all forms of life. Natural ecosystems and habitats. Ecosystems, habitats and spatial surroundings modified or constructed by people, including urbanized areas, agricultural and rural landscape, places of cultural significance, qualities that contribute to their value. (c.f.Nanda, V.K.2002)

The physical and biological world where we live in is called our environment. The environment has two important components:

i) Physical surrounding ii) Biological surrounding.

The Physical environment means the non living environment which includes soil, water bodies and air on the surface of the earth, the climatic factors like sunlight, temperature, rainfall, humidity, atmospheric pressure and wind speed are also considered as a part of physical environment. Biological environment means the living part of the environment i.e. living things. These include plants, animals, human beings and micro organisms like bacteria and fungus.

Environment consists of various types of forces such as physical, social, political, intellectual and emotional etc. which affect the life, nature, growth, development and behavior of the individual. Any situation that endangers the normal routine of education can be considered to be environmental hazard. They are harmful towards the achievement
of educational aims and stand for the pollution of educational goals and educational development.

Environment plays an important role in the development of individual. The individual moves and lives in certain surroundings, which constantly influence and mould his attitudinal behaviour. Healthy environment is essential for the smooth development of personality of an individual.

Environment is not the barren desert of the area where there is no animation. The environment is a fertile part of the earth where organisms exist and interact with each other. There are different types of behaviour. The physical or natural environment, the built in environment, and the social environment are having influence upon human behaviour. The behaviour of humans in all these environments vary on the basis of the needs of the people and type of reaction and interaction they are making with the environment. It is the natural environment that provides all facilities to organisms for a happy living. Every organism makes use of the natural environment for its survival. Birds, animals, humans on the surface of the earth, and all the species living in water, all depend upon the natural environment for their existence. All these creatures including humans get their food and other comforts only in the natural environment.

The natural and the physical environments are so kind to all living creatures as to provide the essential facilities such as food, shelter for survival and protection from all kinds of dangerous physical events. Since the natural environment is kind to humans, humans should also be kind to the natural environment. But humans are hostile towards the environment while making use of its patronage all the times. The ancient man did not harm so much to the environment. Only in the case when the environment was not
flexible for his comforts, he was changing his environment or himself adjusted to live according to the situation.

The physical environment is not a passive background for human settlement. It provides the content for human behaviour. It effects an individual life style and in turn is affected by the person's activity. In contemporary times people are exploiting the natural resources beyond the sustainable limits because of their vested interests. The immediate effect of this ruthless assault on the environment can be seen in terms of health consequences. Human beings constantly adding to the myriad of unwanted and harmful elements in the air, increasing noise level, poor quality of water and heaps of increasing garbage. As the problem has assumed serious proportion, adaptational capacities are strained and people cannot effectively function in a healthy manner.

(c.f. Kumar, T.P. 2009)

Environment issues have acquired the center stage world wide. The industrial revolution of the nineteenth century resulted in the two wars and reconstruction and development plans after the world wars, sidelined the environmental issue till the late 1960's. The entire thrust was on economic and technological development. These compelling techno-economic pursuits led to the unethical exploitation of natural resources. Environment was viewed as an abundant resource that would neither be depleted nor destroyed.

Ancient man identified himself as part of nature, lived as one among the various living species, competed, with other animals only for food and shelter. But because of his superior mental faculties, he started dominating all other living species and used several of them for his comforts, for his betterment. In this pursuit, man slowly alienated himself
from nature. In order to overpower stronger animals he discovered the metal iron, though accidentally. The discovery of making iron from its ore was an important break through in human civilization. Discovery of petroleum and its various constituents revolutionized the civilization further. Thus man explored all the possible mineral sources stored beneath the earth and started extracting metals from them and then making several new alloys from metals. In his quest for more and more comforts, luxuries, wealth and power, man could, just in a span of around two hundred years, do many wonders in the field of agriculture, medicine and industry. Several new alloys, plastics, synthetic rubber, leather products, fossil fuels, nuclear fuels, petrochemicals, fertilizers, pesticides, pharmaceuticals, thousands of various other organic and inorganic chemicals have come into civilization. The civilization has totally changed. The change has been phenomenal.

Man as and when progressed in his scientific and modern attitude, he started to be unkind to natural environment. He mercilessly cut the trees and destroyed the green forests for constructions. The monsoons provide rains regularly for his easy survival because of the evergreen plantations everywhere. The destruction of green trees cause the failure of monsoons and also increase heat in the environment and due to these, certain plantations meet the natural death. Man's continuous constructions of various types like buildings, industries, dams, bridges, roads were in need of increased materials. The available natural materials were not sufficient for his purposes. Therefore man invented many things out of available materials to fulfil his needs. For construction purposes man needs chemical materials and most of them are toxic and poisonous materials. All these produce unwanted and waste areas. Some of the industrial wastage are channelised into fresh water used by the people. All these are going on one side by creating barren fields,
leaving no chance for any green plants. The contaminated river water also spoils the underground water used for cultivation of food products. The area where the urban garbage is dumped cause the most unpleasant smell spreading in the whole air. This is how the natural and physical environment and the fresh air and water are polluted. Neither the industrial organizations which produce the wastage, dust, smoke, contaminated industrial water, nor the municipal corporations, nor the government bother about all these pollutions. Since the garbage and wastage are not removed for long time they pollute the area.  

(c.f.Markendey,D.K. and Markendey,N.R.2011)

It is of utmost importance that the need of healthy environment be realized. By understanding what the environment is all about, learners will realize that environment is our home, our place of survival. Keeping the environment safe is beneficial for the present and future generations. We need to be aware of a healthy environment so as to preserve it.

Good (1959) has defined Awareness as the state of being aware or conscious of a situation or object, without direct attention to it or definite knowledge of its nature.

Environmental Awareness

The relationship between environment and humankind is indeed deep and has been recorded from Vedic period. Furthermore, non-violence towards both animate and inanimate components of biosphere has been engraved as a guiding principle in Indian Psychology. Therefore, awareness and education of environment is paramount concern of all citizens of society. Environment protection starts by creating awareness among the people, so that, it becomes part of their lifestyle. The key to achieving this goal lies in
environment education. It includes awareness, knowledge, attitude, skills and participation of people in protecting the environment.

According to Haque (1978), "An awareness of ones own environment is the primary step towards understanding the ensuing ecological and environmental crisis and also towards its solution. Consequently, several programs have been undertaken by educational as well as other agencies for generating environmental awareness."

Environmental awareness is helping social groups and individuals to acquire an awareness of environment, sensitivity to the total environment and its allied problems. The importance of environmental awareness cannot be ignored, we must understand this to improve the quality of life. It is not only a question of air and water pollution. It includes elimination of disease, hunger, poverty, destruction of forest, erosion of soil and accumulation of waste. So there is an urgent need for proper management of environment.

According to Patel (1994), Environmental awareness is defined as the sum total of response that people make to various thematic aspects of constructive environmental education.

Environmental education is a process of changing our attitudes about the man in relation with his environment. It involves an understanding of problem owing to changes in man's environmental relationship in past and present.

Paradox of the human predicament. “The good that I would, I don’t, the evil that I would not, that I do.” St.Paul The Mahabharata observes: Janami dharmam na ca me pravrthih janamy adharmam na ca me nivrithih, I know the right, but I don’t adopt it. I know the wrong, but I cannot abstain from it. It is the crisis in the human soul which is
reflected in the world. Unless we overcome it in the minds and hearts of men, there will be fear for the future. This paradox of human predicament has caused the destruction of earth’s natural resources and its life sustaining environment. The rapid and indiscriminate industrialization have become an effective tool for endangering human life, health and surrounding environment. (c.f. Mishra, V.S. 2009)

As the world forges ahead into the twenty-first century, it is faced with many prominent problems and issues. Although not everyone agrees about the severity and solutions of the problems, the dwindling of fossil fuels, forests, bio-diversity and aquifers can no longer be denied. Man is his own enemy. As, it has been observed that all his inventions and discoveries have improved him a lot but at the same time, they threaten his very existence due to environmental pollution.

**Environmental pollution** means making the environment unclean, impure by throwing all sorts of contaminated material that perishes on the road and dumping garbage in the residential areas where people are living. It is the people, who do not have any civic sense and health consciousness, contribute to the environmental pollution.

**Odum (1975)** defined pollution as an undesirable change in the physical, chemical or biological characteristics of air, land and water that may or will harmfully affect human life or that of desirable species, industrial processes, living conditions and cultural assets. In other words, pollution is an unfavourable alteration of the environment largely as a result of the human activity cycle, be it industrial or human made, creates an ecological imbalance, which is the cause of environment pollution.

**Pollution** means the direct or indirect changes in the environment which are harmful, undesirable to living organisms. There are several kinds of pollution and the
causes are also numerous. Due to the rapid rate of increase in the human population, the space on earth available for each man is getting smaller. The needs of modern man are also increasing both in quantity and complexity whereas the storehouse of natural resources is limited. In the process of the manufacture of certain goods, Some materials are invariably thrown out as wastes. The amount of wastes that are dumped in soil, water and air have reached such proportions that due to limitation of space the waste dumping space of one section of population is the living space of another. Thus, due to industrialization and technology, environmental pollution is on the increase globally.

Types Of Pollution

Different types of pollution are posing dreadful health hazards to human life. They are air pollution, water pollution, soil pollution, solid waste pollution, radio active pollution and noise pollution.

**Air Pollution**

Air pollution is addition of gases, smoke, dust and chemicals into air beyond a threshold value which poses immediate or delayed adverse effect on human beings, animals, vegetation, microbes, human assets and resources.
Pollutants in the atmosphere contaminate the air leading to air pollution. Atmospheric pollution is principally caused by man. Carbon monoxide, sulphur hexaflouride, ammonia, hydrocarbons and ethylene which is present in automobile exhausts are the common air pollutants.

Large quantities of particles enter into the atmosphere through technological activities. Hydrocarbons are emitted in huge quantity by the burning of petrol in the automobiles. Tetraethyl lead is commonly used as an additive to gasoline, it is blamed for causing atmospheric pollution and respiratory diseases in human beings. Another toxic pollutant is Peroxy acetyl nitrate, which is a by product of automobile exhausts is reported to suppress photosynthesis.

Particulate pollutants reflect too much of light and reduce visibility. It is found that cement dust around cement factories settles on tree leaves and reduces the chlorophyll content and leaf sizes in many trees, thus reducing the overall primary production. There are many kind of biological materials in the air like bacteria, fungal spores, pollen grains etc. which quite often cause allergy and bronchial troubles like asthma. Besides reducing visibility and causing diseases, the particulate pollutants adversely affect plant life in a number of ways such as photosynthesis, necrosis in leaves and diseases.

Air pollution has created a considerable interest and a global effort is being made to control it. Air pollution has very bad effects on human health. Not only this but also it is responsible for corrosion of metals.

(c.f. Kumar, T.P. 2009)
**Water Pollution**

Water pollution is the degradation of the quality of water due to addition of substances (biological e.g. silt, chemicals e.g. inorganic salts, heavy metals, organic chemicals) or factors e.g. heat so that it becomes a health hazard and unfit for use.

Water bodies such as ponds, lakes or rivers have been used as dumps for the wastes of villages, towns and cities. There are different kinds of pollutants such as sewage, organic chemicals like detergents and pesticides, inorganic chemicals, harmful micro organisms and sediments. In the sea radioactive materials are also being dumped. Certain chemical processing industries discharge mercury components, these compounds in the form of chemical effluents get into the water and then to the aquatic environments, the effluents enter the bodies of animals and also human beings. Both the aquatic and marine environment is effected by the chemical toxicants. Mercury compounds which enter into the bodies of human beings lead to mercury poisoning, it results into the impairment of vision and muscles. Ultimately the patient suffers from convulsions, madness, paralysis, coma and death.

Polluted waters are turbid, not pleasant for drinking, sometimes smell bad, and are not suitable for bathing or washing. They are generally harmful and diseases like typhoid, dysentery and cholera are spread through polluted waters.


**Soil Pollution**

Soil Pollution means alteration of soil brought about by dumping of wastes over it so that it cannot be used for the purpose it is meant. Arsenic, chromium and nickel are
suspected to be increasing in quantity in the soil environment. Unrestricted use of fertilisers, pesticides and other chemicals add to the pollution. Effluents and fertilizers reduce both the quantity and quality of agricultural crops and the soil properties are also adversely affected. Consequently, many of the chemical elements find their way into the human body primarily through the food chain.

Solid Waste Pollution

Most of our daily needs are obtained from the market in nicely packed containers made up of thin polythene, plastics, glass etc. After the use of contents the packing material is usually thrown out as garbage. Many of the old used up things like automobile spares, machines, cycle parts etc. are thrown out. Some of them are degradable by the activity of micro-organisms in nature and the materials are recycled but some are not degraded like metals, plastic, nylons and polythenes. Solid wastes are assuming alarming proportions in affluent countries like those of America and Europe, where labour charges of waste collection are high. In India however all old junks are purchased by professional hawkers from house to house.

(c.f. Khitoliya, R.K. 2008)

Radioactive Pollution

Nuclear war materials and test explosions are principal sources of radioactive wastes in the atmosphere, soil and water. Already two thousand nuclear detonations must have been done in underground, under ocean and in atmosphere and the cumulative radioactivity level is rising particularly in oceans. Ionizing radiations cause mutation, abnormality and lethality in many organisms, including man. Cancer is commonly caused even under low level exposures. Radiation effects persist for a very long period in the
environment, therefore, an utmost caution and complete foolproof of technology is needed in handling such scientific activities to prevent radioactive pollutions.

**Noise Pollution**

Noise pollution is the release of unwanted, irritating and often excessively higher level of sound. It is a physical type of pollution which does not leave any residue. Noise pollution affects the receiver directly and often causes a permanent damaged ear drums.

Sound is produced in many kinds of work and we use and enjoy sound in talk and music. Only when sound is not liked or is unwanted we call it as noise. When the loudness of the sound is irritating, unbearable we regard it as noise pollution. Loudness of sound can be measured in terms of energy, decibels. Scooters, trucks and buses create about 90db. Uncomfortable noise inside factories usually exceeds 100db and jet planes while taking off create noise in the range of 150db and rocket engines about 180db. Sound beyond 80db can be safely regarded as pollution for it harms our hearing ability. Beyond 100db the sound becomes very uncomfortable and beyond 120db it is painful. Noise interferes with communication, causes loss of hearing and disturbs mental peace.

Persons living in the humdrum of cities and industrial townships become hard of hearing at young age. Noise also causes mental stress, increase in the rate of heart beat and sometimes damages eye sight, brain and liver functioning.

*(c.f.Kumar,T.P.2009)*

In addition to these, some of the agricultural, animal, agro industrial and community wastes available in rural and adjoining areas are at present not utilised in an economic manner. Due to these wastes, unhygienic conditions prevail in the society. Ultimately this creates environmental pollution. If the wastes from different sources are
utilised properly it will be a positive step to control pollution. For example paddy husk can be used as fuel, activated carbon can be manufactured from paddy husk, carbon can be useful for decolourisation of vegetable oils, sugar solutions etc. Rice bran is a rich source of oil which can be used for edible and industrial purposes. Similarly, wheat bran can be utilised for the manufacture of amylase, amyloglucosidase and pectinolytic enzymes for food industry and fugal acid protease for leather industry.

Coconut and coir can be used as raw materials. Recently coconut pith is used in the joint fillers of roads and buildings. Moreover, cement coconut pith concrete is used in thermal insulation. Many other by products of agriculture can be used as useful products through proper processing.

The natural environment by itself is clean and beautiful, it is man who destroys the purity and cleanliness of the environment by his aggressive attitude towards the environment. Further, man inspite of so much of the development of science and technology, has not learned how to live a healthy life. In most of the Indian cities and towns of urban areas, leaving alone the rural area, there are no proper water drainage and sewage systems. People are not health conscious. Sanitary conditions are bad. Roads and streets are not kept clean. Everywhere around there is a heap of waste. Garbage pits are not cleared. People have no other option but to live in the midst of impure and unclean areas succumbing to all sorts of diseases. Their health is getting spoiled by breathing the polluted air, there is no chance for fresh air in these situations. Since the environment is fully polluted and there is no chance for improvement in their sanitary conditions, their drinking water also gets contaminated.
Therefore, people slowly get infected with germs and virus and suffer from all sorts of diseases. They die without knowing the real cause of death. The public health department would run for rescue only when large number of people die of infection and epidemic diseases and also they do not find out remedy for the real cause of the deaths permanently. They provide only some temporary remedies and do not make any permanent arrangements.

Since the industrial organizations do not make any arrangements to recycle the waste products, they cause pollution in an unending manner. For example, the sugar mills, paper mills, chemical industries, fertilizers, leather industries, cement industries, mining and coal industries cause much serious pollutions like producing stink smells, dusts, smokes, draining the waste products in the fresh water rivers. Thus contaminating the water, killing the fishes, spoiling the health of the people and also pollute the surrounding areas and leave unhealthy effect on the environment. Investigators have stated that the new techniques to deal with the toxic wastages making them harmless and ineffective are undoubtedly important at this juncture. This can be done if only the industries, the government and the people decide that it is very essential even though it appears to be expensive.

If the environment is to be kept clean and pure, techniques should be developed to recycle the wastage and convert them into some useful material. For example, the garbage and the waste products can be converted into some kind of manures or fertilizers instead of allowing them to pollute the environment.

The industrial ashes, the coal dusts, in the coal mine areas and in the railway station areas were thrown indiscriminately. The air in these areas are filled with dusts
which spoil the health of the people, who are not only working in these places, but also those who are living close to these areas. There is nobody, including the people who work there, bother about the health conditions of these people. Generally these people suffer from diseases like tuberculosis, asthma and several other cardiovascular disease and die. Therefore, it is essential that people must know the disastrous consequences of the environmental pollution.

It is not sufficient if only they know the consequences of environmental pollution. They must restrain themselves from polluting the environment. People throw all sorts of unwanted things on the streets and roads. It may be bundle of waste papers, cigarette and beedi pieces left after smoking, empty tins, unwanted medicines, chemical substances, iron, lead and all sorts of metal pieces, plastic bags, burning refuse, burnt and old dirty clothes, torn pillows and bed cottons, perished vegetables, animal bones and rotten eggs & mutton pieces, bird feathers, damaged domestic materials—all contribute to the environmental pollution.

People especially those living in urban areas have now begun to realize that urban life has become very difficult due to continued exposure to the tension ridden physical environment. For example, the traffic hazards, unclean and contaminated water supply, unclean and dirty road and street, full of garbage and all sorts of waste and dust filled air, all pollute the environment. The urban air is a mixture of smokes and gases released by the transports. The dark smokes are released indiscriminately on the roads and also thrown into the residential areas where people live. People can escape from breathing these dark gas smokes only by having some face mask. The lung diseases or some respiratory ailments like asthma and tuberculosis are becoming common occurrences.
Man encroaches the clean natural environment and spoils the purity of it for his personal conveniences without any thought about the consequences of his action. The industries, mills and factories have their own shares in the city suburban areas in polluting the environment. This also is extended into the rural area by way of preparing materials for the constructions like brick industries, cement factories etc. Sustainable Development can provide a solution.

Sustainable Development, a development strategy which is thought a balanced approach for ecology and economy in such a state of affairs is a development strategy that manages all assets, natural and human resources as well as physical including financial assets for increasing long term wealth and well being.  

This has been realized all over the world and certain awareness has taken place in most of the foreign countries and they all started to control such pollutions. In India, the government set up a separate department called Environment Pollution Control Board all over India to deal with the environmental pollution. In every state there is an environmental control board which is only an advisory board and has no power to take action directly against the person or industries that are polluting the environment. The pollution of the physical or natural environment often arouses in us the emotion of anger in a number of ways when we see that the roads and streets are filled with garbage and the fresh water either in the river or in some reservoirs are polluted. In this way, since the environmental pollution cause physically and mentally painful experiences to humans and affect their physical and mental health aspects, it is important that every citizen of India should know something about the causes and consequences of environmental pollution. 

(c.f. Saxena, R. 2011)

(c.f. Nanda, V. K. 2002)
Each year, on 5th June, World Environment Day provides an opportunity for communities and governments around the world to reflect on the essential role that environment plays in our daily lives and our plans for the future. This event is one of the principle vehicle through which the United Nations stimulates worldwide awareness of the environment and enhances political attention and action.

Global warming has emerged as one of the most important environmental issues ever to confront humanity. This concern arises from the fact that our everyday activities may be leading to changes in the earth’s atmosphere that have the potential to significantly alter the planet’s heat and radiation balance. It could lead to a warmer climate in the next century and thereafter, pertending a potpourri of possible effects mostly adverse.

With the advancement of science and technology, efforts are being made to invent all conceivable comforts and luxuries of life. But in this hope of providing all amenities of life to the forthcoming generations. They have become forgetful of the way they are aggravating the health problems. We cannot forget the traffic noise of vehicles and horns besides the smoke that they let out, which are the main sources of sound and air pollution.

(c.f. Shagufta, C.J. 2010).

In this changing environment, various environmental factors have been influencing the attitude of students. Individual attitude undergoes radical changes under certain conditions. Attitudes denote the inner feeling or internal functioning of an individual, the concept of attitude has been used to denote the sum total of man's inclinations and feelings, ideas and thoughts of any specified situations. An attitude is an emotional reaction towards a person or thing. It is a personal response to an object developed through experience which can be characterized as favourable or unfavourable.
Allport aimed three features of attitudes:

a) Preparation of readiness for favourable or unfavourable responses.

b) Which is organized through experience.

c) Which is activated in the presence of all objects and situations with which attitude is related.

Attitude cannot be observed but must always be inferred from behaviour. The process of measuring attitudes can be conceptualized as consisting of three stages.

1. Identification of the types, behaviour samples that are acceptable as a basis for making inference.

2. Collection of sample of behaviour

3. Treatment of the behavior samples so as to convert findings about them into qualitative variables.

Although a great deal of research has been done on the third aspect insufficient attention has been given to the acceptability to behaviour samples and to the produces by which such samples are obtained.

According to Travers (1973) "An attitude is a readiness to respond in such a way that behaviour is given a certain direction."

According to Whittaker (1970)" An attitude is a predisposition or readiness to respond in a predetermined manner to relevant stimuli."

As an attitude is a pre-requisite for fostering, valuing approach and responsible action which is the ultimate goal of environmental education. Moreover, the environmental knowledge and awareness would be of no meaning without cultivation of right attitudes towards environment especially environmental pollution. It is true that
generally people would develop indifferent attitude towards environmental pollution. But if they are educated properly and know the bad effects of the pollution, it is sure that they would accept the idea and try to avoid it.

1.2 RATIONALE OF THE STUDY

Twenty-first century marks the era of science and technology. It marks the shift from traditional teaching to the use of CAI. It is essential for researchers to develop CAI on various subjects and study their effectiveness. Science has made a revolutionary contribution to add to human happiness and progress, no doubt, but in another way it has become a great threat to human survival. The biggest danger of industrialization is proving to be environmental pollution, which has led to suffocation and pollution all around. The increased pollution level has resulted into rise in temperature during summers and fall in temperature during winters due to green house effect. The whole biosphere is at the target of pollution. The misuse and abuse of science has dealt a deadly blow to the entire setup of nature. It is feared that if the present rate of air, water, soil, solid waste, radioactive & noise pollution continues, it will lead to the gradual extinction of mankind as it is posing deadly danger to the man's health safety and brighter future. This dreadful problem calls for a total overview of the very mind set of the people by making them aware of the importance of having healthy and pollution free environment. (c.f. Shagufta, C. J. 2010)

In the modern world, besides many disastrous effects on environment, technology has provided with computers, a boon for mankind. To eradicate the negative effects of progress on environment, computer can prove a useful tool.
In this changing scenario from the traditional teaching methodology to computerized instructions, students need to adapt to these techniques. So it is of utmost importance to conduct researches on global issues like environment using computer assisted instructions. With the advent of new knowledge and flexible thoughts about advancing techniques and innovations in the field of environment, students can bring a positive change.

Students are the nation developers, their attitudes, habits, manners and character play an important role in shaping and moulding the nation. This study can prove to be a small contribution towards a clean and healthy environment.

No doubt, researches are being conducted on environmental awareness and attitude towards environmental pollution. Yet there is dearth of studies on development of computer assisted instructions on environment awareness and for the establishment of theories on the relationship of environmental awareness and attitude towards environmental pollution. This amplifies the need and importance of research work in this area.

Never before in the history of mankind has a society been as it is today. Science has become synonymous with survival. It would not be an exaggeration if we say that we live in the age of science, engineering and technology. The reason is that, there is hardly a place over the globe where the fruits or products of science in one form or another have not yet entered. Distance and time stand fully annihilated. Death rate has decreased. In this way, new civilization is emerging in our lives and it brings in new life styles, new political conflicts and beyond this an altered consciousness. We grope for words to describe the full power and reach of this extraordinary change. This vast explosion of
knowledge has also led to exploitation of natural resources. Concern for environment is the prerequisite for behavior modification. And students can play a major role in moulding the ideologies of society.

In the field of education, there is utmost need for researches on new technologies like computer assisted instructions so as to enable educational institutes to acquaint our future task force with the world class educational technologies. Computer literacy has spread far and wide but still there is dearth of computer assisted instructions in the field of education. The corporate world has to large extend used computers for its benefits but the educational field is still lagging behind. (c.f. Chhabra, S. and Dhamija, N., 2013)

So we need to make the students of our society well aware of environmental issues. Environmental studies has become a compulsory subject in schools so it becomes necessary to find out the attitude and awareness of students about environment, who play a significant role in developing our nation. They form our future task force and the impact of the ideology of future generations can lead to a positive change. In this respect students can play a dominant role in bringing about healthy change in the society by appraising them of the importance of keeping environment free from all sorts of pollution. Being a teacher educator of science background and having a positive attitude towards healthy environment the researcher has been prompted to take up the present study.
1.3 STATEMENT OF THE PROBLEM

EFFECT OF COMPUTER ASSISTED INSTRUCTIONS ON ENVIRONMENTAL AWARENESS AND ATTITUDE TOWARDS ENVIRONMENTAL POLLUTION IN SECONDARY SCHOOL STUDENTS

1.4 DELIMITATIONS OF THE STUDY

1. The present study was confined to boys and girls of 9th class as secondary school students.
2. The present study was confined to the government and private schools affiliated to PSEB only.
3. The present study was confined to residential areas as rural and urban.
4. The present study was confined to environmental awareness and attitude towards environmental pollution as dependent variables.
5. The present study was confined to computer assisted instructions and conventional method of instruction as independent variables.
6. The present study was confined to secondary school students of Amritsar district.

1.5 DEFINITIONS OF KEY TERMS USED

Environmental awareness

Environmental awareness is defined as the sum total of responses that people make to various thematic aspects of constructive environmental education as understanding, preservation and conservation of environment.

Attitude towards Environmental pollution

Attitude towards environmental pollution means a readiness to respond to or against various types of environmental pollution as air pollution, water pollution, soil pollution
and noise pollution in particular manner as with concern or hate, fear or resentment to a particular degree of intensity.

**Computer Assisted Instructions (CAI)**

Computer assisted instructions refer to method of instruction in which computer is used to instruct the students and where the computer contains the instruction which is designed to teach, guide and test the students until the desired level of proficiency is attained. In the present study computer assisted instructions refers to MS Powerpoint Slides on environmental education.

**Secondary school students**

In the present study 9th class students represent the secondary school students.

**1.6 OBJECTIVES OF THE STUDY**

The study was conducted taking into consideration the following objectives:

**1.6.1 RELATED TO ENVIRONMENTAL AWARENESS**

1. To study the effect of computer assisted instructions and conventional method of teaching on environmental awareness of secondary school students.

2. To study the effect of computer assisted instructions and conventional method of teaching on environmental awareness of secondary school students with respect to their residential area.

3. To study the effect of computer assisted instructions and conventional method of teaching on environmental awareness of secondary school students with respect to their type of school.
4. To study the effect of computer assisted instructions and conventional method of
teaching on environmental awareness of secondary school students with respect to their
gender.

1.6.2 RELATED TO ATTITUDE TOWARDS ENVIRONMENTAL POLLUTION

5. To study the effect of computer assisted instructions and conventional method of
teaching on attitude towards environmental pollution of secondary school students.

6. To study the effect of computer assisted instructions and conventional method of
teaching on attitude towards environmental pollution of secondary school students with
respect to their residential area.

7. To study the effect of computer assisted instructions and conventional method of
teaching on attitude towards environmental pollution of secondary school students with
respect to their type of school.

8. To study the effect of computer assisted instructions and conventional method of
teaching on attitude towards environmental pollution of secondary school students with
respect to their gender.

1.7 HYPOTHESES

1.7.1 RELATED TO ENVIRONMENTAL AWARENESS

1. There exists a significant difference in the effect of computer assisted instructions and
conventional method of teaching on environmental awareness of secondary school
students.

2. Environmental awareness of secondary school students taught by computer assisted
instructions and conventional method of teaching does not differ with respect to their
residential area.
3. Environmental awareness of secondary school students taught by computer assisted instructions and conventional method of teaching does not differ with respect to their type of school.

4. Environmental awareness of secondary school students taught by computer assisted instructions and conventional method of teaching does not differ with respect to their gender.

1.7.2 RELATED TO ATTITUDE TOWARDS ENVIRONMENTAL POLLUTION

5. There exists a significant difference in the effect of computer assisted instructions and conventional method of teaching on attitude towards environmental pollution of secondary school students.

6. Attitude towards environmental pollution of secondary school students taught by computer assisted instructions and conventional method of teaching does not differ with respect to their residential area.

7. Attitude towards environmental pollution of secondary school students taught by computer assisted instructions and conventional method of teaching does not differ with respect to their type of school.

8. Attitude towards environmental pollution of secondary school students taught by computer assisted instructions and conventional method of teaching does not differ with respect to their gender.